State of Hawaii
DEPARTMENT OF LAND AND NATURAL RESOURCES
Division of Aquatic Resources
Honolulu, Hawaii 96813

March 28, 2008

Board of Land
and Natural Resources
Honolulu, Hawaii

Request for Authorization and Approval to Issue a Papahānaumokuākea Marine National Monument Conservation and Management Permit to Joyce Miller, National Oceanic and Atmospheric Administration (NOAA) Pacific Islands Fisheries Science Center, for Access to State Waters to Conduct Mapping Activities.

The Division of Aquatic Resources (DAR) hereby submits a request for your authorization and approval for issuance of a Papahānaumokuākea Marine National Monument conservation and management permit to Joyce Miller, pursuant to § 187A-6, Hawaii Revised Statutes (HRS), chapter13-60.5, Hawaii Administrative Rules (HAR), and all other applicable laws and regulations.

The conservation and management permit, as described below, would allow entry and management activities to occur in the Papahānaumokuākea Marine National Monument (Monument), including the NWHI State Marine Refuge and the waters (0-3 nautical miles) surrounding the following sites:

- Nihoa Island,
- French Frigate Shoals,
- Pearl and Hermes Atoll

The activities covered under this permit would occur from April 1, 2008 through May 31, 2008.

The proposed activities are a renewal of work previously permitted and conducted in the Monument.

INTENDED ACTIVITIES

The applicant proposes to collect bathymetric, backscatter, and groundtruth data to provide information about the seafloor at French Frigate Shoals, Pearl and Hermes, Nihoa Island, and their respective surrounding banks. These data would contribute to an ongoing effort to characterize the seafloor and habitats that exist within the Monument, and would fill gaps in previously collected data. Originally, activities were also to include operation of an unmanned aerial vehicle (UAV) and deployment of satellite-tracked

drifter buoys to detect and track marine debris, but these activities have since been withdrawn from the permit request.

Multibeam mapping would be conducted from both the NOAA ship HI'IALAKAI and a 25-ft. survey launch (R/V AHI). Operations on the launch are daytime only, while shipboard operations may be conducted day or night. All night-time operations are planned so that the ship avoids any shallow areas. In addition to multibeam mapping, proposed activities include collection of optical data using drop or towed cameras and remotely operated vehicles. Dive operations would provide additional ground-truth observations and would be used to determine depth of sediment in order to test a hypothesis about interpreting backscatter data to show sand depths. Divers would determine grain size, photograph each survey site and use a probe to determine the depth of sand cover.

The Coral Reef Ecosystem Division (CRED) and the Pacific Islands Benthic Habitat Mapping Center (PIBHMC) have taken the lead on conducting multibeam and optical validation surveys in the Northwestern Hawaiian Islands (NWHI) since 2001 in collaboration with Reserve and Monument staff. The mapping, camera, and dive operations are designed to provide minimal contact with or impact to the seafloor, and no sample collection is requested.

The activities described above may require the following regulated activities to occur in State waters:

☒ Drilling into, dredging, or otherwise altering the submerged lands other than by anchoring a vessel; or constructing, placing, or abandoning any structure, material, or other matter on the submerged lands

☒ Swimming, snorkeling, or closed or open circuit SCUBA diving within any Special Preservation Area or Midway Atoll Special Management Area

REVIEW PROCESS:

The permit application was sent out for review and comment to the following scientific entities: Hawaii Division of Aquatic Resources, Hawaii Division of Forestry and Wildlife, Papahānaumokuākea Marine National Monument (NOAA/NOS), NOAA Pacific Islands Regional Office (NOAA-PIRO), and United States Fish and Wildlife Service Hawaiian and Pacific Islands National Wildlife Refuge Complex Office. The Office of Hawaiian Affairs (OHA), and the Kaho'olawe Island Reserve Commission (KIRC) were also consulted.

Comments received from the scientific community are summarized as follows:

Scientific reviews support the acceptance of this application.

Concerns raised were:

1. Additional information requested on the sand probe and how it is used;

addition, mapping group personnel volunteer their time for various outreach activities, during which they reach thousands of Hawaii residents, students and teachers each year.

STAFF OPINION:

DAR staff is of the opinion that Applicant has properly demonstrated valid justifications for her application and should be allowed to enter the NWHI State waters and to conduct the activities therein as specified in the application with the following special instructions and conditions, which are in addition to the Papahānaumokuākea Marine National Monument Conservation and Management Permit General Conditions. The following special conditions have been vetted through the legal counsel of the Co-Trustee agencies.

1. To prevent introduction of disease or the unintended transport of live organisms, the permittee must comply with the disease and transport protocol attached to this permit.

2. Tenders and small vessels must be equipped with engines that meet EPA emissions requirements.

3. Refueling of tenders and all small vessels must be done at the support ships and outside the confines of lagoons or near-shore waters in the State Marine Refuge

4. No fishing is allowed in State Waters except as authorized under State law for subsistence, traditional and customary practices by Native Hawaiians.

MONUMENT MANAGEMENT BOARD OPINION:

The MMB is of the opinion that the Applicant has met the findings of Presidential Proclamation 8031 and this activity may be conducted subject to completion of all compliance requirements. The MMB concurs with the special conditions recommended by DAR staff.

RECOMMENDATION:

"That the Board authorize and approve a Conservation and Management Permit to Joyce Miller, NOAA Pacific Islands Fisheries Science Center."

Respectfully submitted,

for DAN POLHEMUS
Administrator

APPROVED FOR SUBMITTAL

LAURA H. THIELEN
Chairperson

Papahānaumokuākea Marine National Monument

CONSERVATION AND MANAGEMENT Permit Application

NOTE: ***This Permit Application (and associated Instructions) are to propose activities to be conducted in the Papahānaumokuākea Marine National Monument. The Co-Trustees are required to determine that issuing the requested permit is compatible with the findings of Presidential Proclamation 8031. Within this Application, provide all information that you believe will assist the Co-Trustees in determining how your proposed activities are compatible with the conservation and management of the natural, historic, and cultural resources of the Papahānaumokuākea Marine National Monument (Monument).***

ADDITIONAL IMPORTANT INFORMATION:

- Any or all of the information within this application may be posted to the Monument website informing the public on projects proposed to occur in the Monument.

- In addition to the permit application, the Applicant must either download the Monument Compliance Information Sheet from the Monument website OR request a hard copy from the Monument Permit Coordinator (contact information below). The Monument Compliance Information Sheet must be submitted to the Monument Permit Coordinator after initial application consultation.

- Issuance of a Monument permit is dependent upon the completion and review of the application and Compliance Information Sheet.

INCOMPLETE APPLICATIONS WILL NOT BE CONSIDERED

Send Permit Applications to:
Papahānaumokuākea Marine National Monument Permit Coordinator
6600 Kalaniana'ole Hwy. # 300
Honolulu, HI 96825
nwhipermit@noaa.gov
PHONE: (808) 397-2660 FAX: (808) 397-2662

SUBMITTAL VIA ELECTRONIC MAIL IS PREFERRED BUT NOT REQUIRED. FOR ADDITIONAL SUBMITTAL INSTRUCTIONS, SEE THE LAST PAGE.

Papahānaumokuākea Marine National Monument
Permit Application Cover Sheet

This Permit Application Cover Sheet is intended to provide summary information and status to the public on permit applications for activities proposed to be conducted in the Papahānaumokuākea Marine National Monument. While a permit application has been received, it has not been fully reviewed nor approved by the Monument Management Board to date. The Monument permit process also ensures that all environmental reviews are conducted prior to the issuance of a Monument permit.

Summary Information

Applicant Name: Joyce Miller
Affiliation: NOAA Pacific Islands Fisheries Science Center, Coral Reef Ecosystem Division, Joint Institute for Marine and Atmospheric Research, and Pacific Islands Benthic Habitat Mapping Center

Permit Category: Conservation and Management
Proposed Activity Dates: 4/28/08 to 5/27/08
Proposed Method of Entry (Vessel/Plane): NOAA Ship Hi'ialakai
Proposed Locations: French Frigate Shoals and surrounding banks, Pearl and Hermes Reef and surrounding banks, Nihoa and West Nihoa.

Estimated number of individuals (including Applicant) to be covered under this permit: 20
Estimated number of days in the Monument: 30

Description of proposed activities: (complete these sentences):

a.) The proposed activity would…
collect bathymetric, backscatter and groundtruth data to provide information about the seafloor at French Frigate Shoals and surrounding banks, Pearl and Hermes Reef and surrounding banks, and around Nihoa Island and West Nihoa Bank. The cruise may also support unmanned aerial vehicle (UAV) flights and satellite-tracked drifter buoy deployments to detect and track marine debris in Monument waters.

b.) To accomplish this activity we would ….
conduct multibeam mapping from both the ship and a 25-ft. survey launch (R/V AHI), camera operations using towed camera sleds, and dive operations to provide additional ground-truth observations. We may also conduct unmanned aerial vehicle flights and deploy satellite-tracked drifter buoys attached to marine debris.

c.) This activity would help the Monument by …

providing baseline depth maps, backscatter imagery, and optical validation data to better characterize the seafloor and the habitats that exist within the Monument. These data support nautical charting, benthic habitat characterization, and planning for biological surveys using the random stratified sampling approach. Optical data collection and diving operations will also support a project to detect invasive species in Monument waters. If UAV and drifter buoy operations are conducted, they will provide the Monument with a greater ability to detect and track marine debris that are a threat to the coral reef ecosystems in the Northwestern Hawaiian Islands (NWHI).

Other information or background: CRED and the Pacific Islands Benthic Habitat Mapping Center (PIBHMC) have taken lead on conducting multibeam and optical validation surveys in the Northwestern Hawaiian Islands (NWHI) since 2001 in collaboration with Reserve and Monument staff. The mapping, camera, dive, UAV, and drifter buoy operations are designed to provide minimal contact with or impact to the sea floor, and no sample collection is requested. Divers will use a non-destructive method to determine depth of sand cover in areas of variable hardness as determined from existing multibeam backscatter data, but this work will only be done in sand-covered areas (i.e., not in coral environments).

Section A - Applicant Information

1. Applicant

Name (last, first, middle initial): Miller, Joyce E

Title: Oceanographer, JIMAR, Coral Reef Ecoystem Division, NOAA Pacific Islands Fisheries Science Center

1a. Intended field Principal Investigator (See instructions for more information):
Miller, Joyce E

2. Mailing address (street/P.O. box, city, state, country, zip):

Phone:

Fax:

Email:

For students, major professor's name, telephone and email address:

3. Affiliation (institution/agency/organization directly related to the proposed project):
NOAA Pacific Islands Fisheries Science Center, Coral Reef Ecosystem Division, Joint Institute for Marine and Atmospheric Research, and Pacific Islands Benthic Habitat Mapping Center

4. Additional persons to be covered by permit. List all personnel roles and names (if known at time of application) here (e.g. John Doe, Research Diver; Jane Doe, Field Technician):
Scott Ferguson (Multibeam Mapping, Camera Operations, Coxswain)
John Rooney (Multibeam Mapping, Camera Operations, Research Diver, Coxswain Training)
Jonathan Weiss (Multibeam Mapping, Camera Operations)
Frances Lichowski (Multibeam Mapping, Camera Operations, Coxswain Training)
Joe Chojnacki (Multibeam Mapping, Camera Operations, Research Diver)
Kerry Grimshaw (Multibeam Mapping, Camera Operations, Research Diver)
Charles Menza (Camera Operations, Multibeam Mapping)
Alisha Bare (Camera Operations, Multibeam Mapping)
Lisa Baldwin (Camera Operations, Multibeam Mapping)

TBD (Camera Operations, Multibeam Mapping, Coxswain Training)
TBD (Camera Operations, Multibeam Mapping)
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TBD (Camera Operations, Multibeam Mapping)

Section B: Project Information

5a. Project location(s):

		Ocean Based	
☒ Nihoa Island	☐ Land-based	☒ Shallow water	☒ Deep water
☐ Necker Island (Mokumanamana)	☐ Land-based	☐ Shallow water	☐ Deep water
☒ French Frigate Shoals	☐ Land-based	☒ Shallow water	☒ Deep water
☐ Gardner Pinnacles	☐ Land-based	☐ Shallow water	☐ Deep water
☐ Maro Reef			
☐ Laysan Island	☐ Land-based	☐ Shallow water	☐ Deep water
☐ Lisianski Island, Neva Shoal	☐ Land-based	☐ Shallow water	☐ Deep water
☒ Pearl and Hermes Atoll	☐ Land-based	☒ Shallow water	☒ Deep water
☐ Midway Atoll	☐ Land-based	☐ Shallow water	☐ Deep water
☐ Kure Atoll	☐ Land-based	☐ Shallow water	☐ Deep water
☒ Other			

NOTE: There is a fee schedule for people visiting Midway Atoll National Wildlife Refuge via vessel and aircraft.

Location Description:
St. Rogatien and Brooks Banks

5b. Check all applicable regulated activities proposed to be conducted in the Monument:

☐ Removing, moving, taking, harvesting, possessing, injuring, disturbing, or damaging any living or nonliving Monument resource

☒ Drilling into, dredging, or otherwise altering the submerged lands other than by anchoring a vessel; or constructing, placing, or abandoning any structure, material, or other matter on the submerged lands

☐ Anchoring a vessel

☐ Deserting a vessel aground, at anchor, or adrift

☐ Discharging or depositing any material or matter into the Monument

☐ Touching coral, living or dead

☐ Possessing fishing gear except when stowed and not available for immediate use during passage without interruption through the Monument

☐ Attracting any living Monument resource

☐ Sustenance fishing (Federal waters only, outside of Special Preservation Areas, Ecological Reserves and Special Management Areas)

☐ Subsistence fishing (State waters only)

☒ Swimming, snorkeling, or closed or open circuit SCUBA diving within any Special Preservation Area or Midway Atoll Special Management Area

6 Purpose/Need/Scope ***State purpose of proposed activities:***
In order to properly manage the waters of the Papahanaumokuakea Marine National Monument, accurate, high-resolution base maps are needed. Mapping data are a critical component of the most basic environmental information required for ecosystem-based management. Acoustic multibeam data provide highly accurate depth information as well as backscatter values that help to define the type of seafloor in the ecosystem. In addition, derived data layers, such as slope, rugosity, Bathymetric Position Indices (BPI) help define features or areas of interest, such as pinnacles, Essential Fish Habitat, areas of flat or sandy habitat, and potentially coral rich sites. Some uses of bathymetry and backscatter data are: depth-based boundary definitions, determining sampling protocols, and identifying anchorage areas, benthic habitats for a variety of species, and foraging areas for monk seals and other protected species.

In addition to multibeam mapping, our proposed activities also include collection of optical data using drop or towed cameras and Remotely Operated Vehicles, deployed from both a small boat and the Hi'ialakai. Optical data, both still photos and videos, are required for ground-truthing of the multibeam data, because the multibeam data provide only acoustic information (a combination of depth, slope, hardness, and roughness parameters). While habitat types can be inferred from acoustic data, to truly understand the benthic habitats present in an ecosystem, direct observational data from cameras or videos must be collected and analyzed. When sufficient ground-truth data are available, predictions of benthic habitat can be made much more accurately than from the acoustic information alone.

At French Frigate Shoals, multibeam data have been collected between 20 and 500 m water depths, primarily on the southwestern bank. IKONOS imagery covers only the northeast crescent of the FFS bank, and there is a significant gap between the two data sets. To better define the area in this gap around LaPerouse pinnacle, 8-10 days multibeam mapping from the 25' survey launch, R/V AHI must be completed. Since FFS is one of three sites in the Monument targeted for early in-depth assessment, it is important to complete as much of this mapping as possible and to better determine exactly what types of data are critical to ecosystem-based management of all banks in the NWHI. The AHI will also be used at Pearl and Hermes Reef to fill in unmapped areas in 15-100 m water depths, primarily on the southern part of the bank. Collection of additional optical ground-truth data is also proposed at FFS and Pearl and Hermes.

Multibeam mapping around Brooks and St. Rogatien Banks in water depths range from 20 to 2000 m is partially completed and finishing these areas has been identified as the 3rd priority on this cruise by the Monument. The 4th priority will be to map as much of W. Nihoa and Nihoa Banks in 15-200 m depths as possible as time allows after completion of the higher priority areas. Ground-truth data will also be collected in waters down to 150 m around all of these banks as time permits.

In order to better interpret multibeam and video data that have been previously collected in the MNM, diving activities to determine depth of sediment are planned. . These data will help us to determine the thickness of sediments such as sand in a particular area and the layering of

substrate that may be of importance to a variety of organisms such as macroalgae and invertebrates. Dive activities are designed to add important information about the nature of the seafloor that cannot be determined from acoustic or optical data. Analysis of existing multibeam backscatter and optical validation data has shown that areas identified visually as sand show both very high and very low backscatter, which is interpreted as very hard and very soft. We hypothesize that there is only a thin veneer of sand in the "hard" areas, while the "soft" areas have much deeper sand cover. Divers will determine grain size, photograph each survey site and use a probe to determine the depth of sand cover.

UAVs would be used to detect the location of marine debris sites. Satellite-tracked drifter buoys would be attached to free-floating debris to understand the movement of marine debris throughout the Pacific according to seasonal variations.

All data collected during previous NWHI cruises are available through a public-access website at www.soest.hawaii.edu/pibhmc. Bathymetric data collected on this cruise will be made available via this website within 6 months of cruise completion and backscatter and optical data within one year of cruise completion.

7. Answer the Findings below by providing information that you believe will assist the Co-Trustees in determining how your proposed activities are compatible with the conservation and management of the natural, historic, and cultural resources of the Monument:

The Findings are as follows:

a. How can the activity be conducted with adequate safeguards for the cultural, natural and historic resources and ecological integrity of the Monument?

Multibeam mapping and optical data collection are non-extractive activities with adequate safeguards for the resources and ecological integrity of the Monument. The frequencies and power levels at which the three multibeam sonars operate (30, 240, and 300 kHz) do not cause harm to the environment or the organisms within it. The 25' survey launch, AHI, and the Hi'ialakai have conducted multibeam surveys in the Monument waters since 2003 and 2005, respectively, with no harm to the environment. Similarly, optical data have been collected from a variety of vessels in the Monument waters since 2001 with no damage to the environment. There is a slight potential for damage to coral resources if the optical vehicle comes in contact with these structures, but this has been minimized by allowing the vehicle to drift under the launch or ship, rather than towing the vehicle behind the ship or launch.

The proposed diving activities are designed to have minimal impact upon the seafloor. Probing will be done in as non-destructive a manner as possible to determine depth of sand. No samples will be collected, instead grain size shall be determined using grain size cards and photography. UAS and drifter buoy operations are designed to have no harmful effects.

b. How will the activity be conducted in a manner compatible with the management direction of this proclamation, considering the extent to which the conduct of the activity may diminish or enhance Monument cultural, natural and historic resources, qualities, and ecological integrity, any indirect, secondary, or cumulative effects of the activity, and the duration of such effects?

All management regulations pertaining to the Monument are strictly adhered to when conducting operations within the Monument and, in particular, in Special Preservation Areas. All activities proposed here provide critical data that will greatly enhance the Monument managers' ability to characterize and understand the ecosystems and/or the patterns of marine debris within the Monument. As stated in item a, all scientific methods to be used on this cruise are designed to have minimal, if any, negative effects on the environment. Except for a very slight chance of the optical vehicle contacting the seafloor and divers probing to determine sand depth, there are no anticipated indirect, secondary or cumulative effects of the proposed methods.

c. Is there a practicable alternative to conducting the activity within the Monument? If not, explain why your activities must be conducted in the Monument.
In order to provide basemaps in the waters of the Monument, multibeam, optical, and diving operations must be conducted there. In order to determine the existence of marine debris and the patterns of its movements in the NWHI water, UAV and drifter buoy operations must also occur in the Monument.

d. How does the end value of the activity outweigh its adverse impacts on Monument cultural, natural and historic resources, qualities, and ecological integrity?
There are minimal adverse impacts to the Monument cultural, natural and historic resources, qualities and ecological integrity from the proposed activities, and all activities contribute significantly to an understanding of the ecosystems within the Monument and/or the detection and understanding of marine debris in the monument. All participants in the cruise will attend a meeting for a cultural briefing prior to the cruise.

e. Explain how the duration of the activity is no longer than necessary to achieve its stated purpose.
Multibeam mapping surveys are conducted until all areas that can be safely surveyed in the time alloted for the work are fully covered. Optical data collection is conducted in the same areas as the multibeam mapping occurs, until sufficient optical validation data have been collected to provide an understanding of the seafloor or if optical data collection is terminated to facilitate multibeam surveying in a different area. If insufficent optical data are available, additional data collection may be required at a later date to more completely define the habitats in an area. Diving activities are planned in conjunction with optical data collection and the number of dives in an area will be determined by the number of days of multibeam operations. UAS surveys and drifter buoy deployments are "piggyback" operations and the number of deployments in any one location will also be determined by multibeam operations.

f. Provide information demonstrating that you are qualified to conduct and complete the activity and mitigate any potential impacts resulting from its conduct.

Personnel from NOAA Pacific Islands Fisheries Science Center's Coral Reef Ecosystem Division and the Pacific Islands Benthic Habitat Mapping Center have collected a significant portion of existing multibeam and optical data that are available within the Monument waters and in other U.S.-related Pacific Islands. The Chief Scientist has over 25 years of experience in conducting multibeam surveys and has been responsible for the majority of multibeam and optical mapping operations in the Monument since 2001. She is also a certified American Congress of Surveying and Mapping Offshore Hydrographer. Proposed team members are either experienced mapping personnel or will be trained in mapping during this cruise under the guidance of the Chief Scientist

g. Provide information demonstrating that you have adequate financial resources available to conduct and complete the activity and mitigate any potential impacts resulting from its conduct.
NWHI mapping operations are funded by yearly grants from the NOAA Coral Reef Conservation Program to the Coral Reef Ecosystem Division, which is a part of the NOAA Pacific Islands Fisheries Science Center.

h. Explain how your methods and procedures are appropriate to achieve the proposed activity's goals in relation to their impacts to Monument cultural, natural and historic resources, qualities, and ecological integrity.
Standardized survey procedures used in hydrographic surveying are employed during multibeam mapping operations. A procedures manual, including safety instructions, for both ship and survey launch are followed and enforced. While optical data collection is not as codified as multibeam surveying, safety and environmental safeguards are routinely followed. All procedures are documented on the Pacific Islands Benthic Habitat Mapping website at www.soest.hawaii.edu/pibhmc. A Dive Plan has been formulated and all NOAA diving procedures will be followed. Multibeam, optical , diving, UAS, and drifter buoy procedures are discussed under Section 8.

i. Has your vessel has been outfitted with a mobile transceiver unit approved by OLE and complies with the requirements of Presidential Proclamation 8031?
Under a separate permit, the Hi'ialakai is outfitted with a mobile transceiver unit.

j. Demonstrate that there are no other factors that would make the issuance of a permit for the activity inappropriate.
We are not aware of any other factors that would make the issuance of a permit for the activity inappropriate.

8. Procedures/Methods:
Multibeam mapping is conducted using sonars on both the NOAA Ship Hi'ialakai and the 8 meter program provided survey launch R/V AHI. The AHI operates only during daylight hours, generally from approximately 7:30 to 16:30 in water depths from 5 to 200 m depths. Shipboard multibeam mapping is done both during the day and night. In general the R/V AHI, with a draft of less than 1 m, collects data in shallower areas so that the ship stays well away from potentially dangerous shoal areas. Shipboard night-time mapping is conducted in deeper waters to minimize

risks from surveying in shallow waters after dark. The ship will conduct operations in accordance with the Commanding Officer's Standing Orders. Operational procedures for multibeam mapping are documented on the PIBHMC documentation page at www.soest.hawaii.edu/pibhmc/pibhmc_documentation.htm. Documents that are particularly pertinent to multibeam mapping include: Multibeam Acquisition Overview, Multibeam Bathymetry Processing Overview, the Multibeam Backscatter Processing Overview, Hydrographic Surveying Using the SAIC ISS-2000 System, R/V AHI Safety and Operations Manual, AHI Multibeam Systems Block Diagram, Hi'ialakai System Calibration, Feb 2005, and Hi'ialakai Systems Integration, April 2005.

Multibeam mapping is the highest priority activity and is planned for approximately 8-10 days at FFS. We have no need or plans to go ashore, unless requested to deliver personnel or supplies by the Monument Co-Trustees.

Optical data collection is done either from the Hi'ialakai or from launches. Operations on the launches are daytime only, while shipboard operations can be conducted day or night. All night-time operations are planned so that the ship avoids any shallow areas. Towed camera sleds or Remotely Operated Vehicles are deployed in accordance with safety and standard procedures for these operations. A description of these systems and how they are operated can be found at http://www.soest.hawaii.edu/pibhmc/pibhmc_sleds.htm and in documents on the PIBHMC documentation page at http://www.soest.hawaii.edu/pibhmc/pibhmc_documentation.htm, Optical Analysis Overview and Benthic Habitat Classification Scheme.

Dive sites will be selected in advance of cruise departure. Potential dive sites will be constrained by proximity to the Hi'ialakai's planned work area, and by depths shallower than 130'. Target sites will be chosen by the need for ground-truthing of specific portions of the multibeam data layers, and coordinates will be selected to assist the dive team in finding the location. Divers will descend to the bottom as close to the targeted point as possible, and will mark off a 9-point grid on the substrate using the original location as the centroid. From the centroid, points will be spaced at 10m intervals in the four cardinal directions. The remaining four points will form the corners of the 9-point grid, and will be spaced 10m from the existing cardinal points. At each of the 9 points, 3 actions will be taken: if present, sediment will be photographed next to a sediment scale card to determine sediment grain size without taking samples; a sand probe will be used to determine the depth of any sediment layer; and a top-down photograph will be taken of the surface from 1m above the substrate for analysis of substrate composition in accordance with existing PIBHMC techniques.

If a planned March/April unmanned aerial vehicle (UAV) cruise on the Sette does not take place, a UAV and drifter buoys would be deployed this HI-08-04.. The UAVs would be deployed (hand launch or balloon launch) from the Hi'ialakai and monitored/piloted by a shipboard control operator. The location of marine debris sites would be identified during the flight using streaming video coupled with known flight path data. At the conclusion of each survey flight, UAVs would complete a water landing and be recovered by small boats, with no impact to the environment. If successful, UAVs could then be launched in the subtropical convergence zone

in subsequent research cruises to help target removal efforts in the open ocean. In addition drifter buoys would be attached to floating marine The proposed buoys have a small cylindrical shape and are approximately 10 inches high and 18 inches in diameter. Un-tethered, they have a draft of 8 inches. It is anticipated that the tether will consist of three 8 foot segments of 1" floating line connected by swivels. The tether is a total of 24-40 feet long. The free end of the tether can be affixed to floating derelict fishing gear by a shackle or secure knot. The buoys will be left on the debris to track the buoy and monitor oceanographic movements. If the buoy and debris becomes fouled on the reefs of the NWHI, they will be retrieved, if possible within vessel and weather constraints.

Monument staff from partner agencies may be incorporated in the scientific crew to collect multibeam and optical data. We do not anticipate requiring any further Monument staff to maintain the equipment or collect data in our absence.

NOTE: If land or marine archeological activities are involved, contact the Monument Permit Coordinator at the address on the general application form before proceeding, as a customized application will be needed. For more information, contact the Monument office on the first page of this application.

9a. Collection of specimens - collecting activities (would apply to any activity): organisms or objects (List of species, if applicable, attach additional sheets if necessary):

Common name:
N/A

Scientific name:
N/A

& size of specimens:
N/A

Collection location:
N/A

☐ Whole Organism ☐ Partial Organism

9b. What will be done with the specimens after the project has ended?
N/A

9c. Will the organisms be kept alive after collection? ☐ Yes ☐ No
N/A

• General site/location for collections:
N/A

• Is it an open or closed system? ☐ Open ☐ Closed
N/A

• Is there an outfall? ☐ Yes ☐ No
N/A

• Will these organisms be housed with other organisms? If so, what are the other organisms?
N/A

• Will organisms be released?
N/A

10. If applicable, how will the collected samples or specimens be transported out of the Monument?
N/A

11. Describe collaborative activities to share samples, reduce duplicative sampling, or duplicative research:
N/A

12. List all specialized gear and materials to be used in this activity:
EM 300 and EM3002 multibeam sonars on both Hi'ialakai and Reson 8101ER multibeam sonar on R/V AHI, both include specialized attitude sensing equipment (POS-MV) and ISS2000 survey system. Optical sensors will include: Two modified Phantom ROVs equipped with a Deep Sea Power & Light Multi SeaCam 2060 low-light color video camera, two 500 watt DeepSea Power & Light model 710-0400601 underwater lights, a Tritech PA200/20-PS sonar altimeter to detect the height of the camera above the seafloor, a Deep Sea Power & Light SeaLaser 100 pair of parallel lasers for scaling, a compass to determine the sled heading and orientation, and a depth (pressure) sensor. Unmanned Aerial Vehicle. Drifter buoys.

13. List all Hazardous Materials you propose to take to and use within the Monument:
No HazMat materials are needed to conduct this project, except those associated with routine operation and maintenance of ship and launches, which are included under the separate Hi'ialakai permit. A maximum of 100 gal of diesel and 2 gal of engine oil is carried aboard the R/V AHI. In addition, a minimal amount of hazardous materials are kept on board to allow for routine maintenance and underway repair.

14. Describe any fixed installations and instrumentation proposed to be set in the Monument:
N/A

15. Provide a time line for sample analysis, data analysis, write-up and publication of information:

Multibeam bathymetric data are routinely processed within 6 months of the end of the cruise period and published on the PIBHMC website at www.soest.hawaii.edu/pibhmc in gridded form. Multibeam backscatter are processed and made available on the same website within 18 months of data collection. Optical data are processed and made available within 2 years of data collection. All multibeam swath data are sent to the National Geophysical Data Center, which is the national archive for multibeam data, within one year of data collection. Metadata documenting all data sets are prepared and hosted both on the PIBHMC website and through the Coral Reef Information System, CoRIS.

16. List all Applicant's publications directly related to the proposed project:

1) NOAA Seafloor Mapping and Characterization in the Hawaiian Archipelago. Miller et al. Oceans 2006,

2) Seafloor Characterization using High-Resolution Multibeam Bathymetry and Backscatter at French Frigate Shoals, Northwestern Hawaiian Islands. Weiss et al. Oceans 2006

3) Collaborative Nautical Charting and Scientific Seabed Mapping Missions: A Case Study in the Northwestern Hawaiian Islands. Evans et al. Sea Technology, June 2004

4) Pacific Moderate Depth Mapping Implementation Plan, 2003. Rohman and Miller.

5) Bathymetric Atlas of the Northwestern Hawaiian Islands, A Planning Document for Benthic Habitat Mapping, 2004.

6) All NWHI multibeam and optical data collected to date are publicly available at www.soest.hawaii.edu/pibhmc.

With knowledge of the penalties for false or incomplete statements, as provided by 18 U.S.C. 1001, and for perjury, as provided by 18 U.S.C. 1621, I hereby certify to the best of my abilities under penalty of perjury of that the information I have provided on this application form is true and correct. I agree that the Co-Trustees may post this application in its entirety on the Internet. I understand that the Co-Trustees will consider deleting all information that I have identified as "confidential" prior to posting the application.

Signature Date

SEND ONE SIGNED APPLICATION VIA MAIL TO THE MONUMENT OFFICE BELOW:

Papahānaumokuākea Marine National Monument Permit Coordinator
6600 Kalaniana'ole Hwy. # 300
Honolulu, HI 96825
FAX: (808) 397-2662

DID YOU INCLUDE THESE?

- ☐ Applicant CV/Resume/Biography
- ☐ Intended field Principal Investigator CV/Resume/Biography
- ☐ Electronic and Hard Copy of Application with Signature
- ☐ Statement of information you wish to be kept confidential
- ☐ Material Safety Data Sheets for Hazardous Materials

Papahānaumokuākea Marine National Monument
Compliance Information Sheet

1. Updated list of personnel to be covered by permit. List all personnel names and their roles here (e.g. John Doe, Diver; Jane Doe, Field Technician, Jerry Doe, Medical Assistant):

Name	Position	Affiliation	Telephone #	E-mail address
Joyce Miller	Oceanographer	JIMAR-NMFS		
Scott Ferguson	Lead Logistics Management Spec	NOAA/PIFSC		
John Rooney	Coastal Geomorphologist	JIMAR-NMFS		
Charlie Menza	Marine Biologist	NCCOS-CCMA		
Jonathan Weiss	Seabed Mapping Spec	JIMAR-NMFS		
Frances Lichowski	Seabed Mapping Spec	JIMAR-NMFS		
Joe Chojnacki	Field Operations Spec	RCUH-PMNM		
Kerry Grimshaw	Marine Ecosystem Research Spec	JIMAR-NMFS		
Alisha Bare	Student	JIMAR-NMFS		
Lisa Baldwin	Student	JIMAR-NMFS		
Zach Hecht-Leavitt	GIS Specialist	NCCOS-CCMA		
TBD				
TBD				
TBD				
TBD				
TBD				
TBD				
TBD				
TBD				
TBD				

2. Specific Site Location(s): (Attach copies of specific collection locations):

Bounding Box Coordinates:

Island/Reef/Atoll	West_Lon	East_Lon	North_Lat	South_Lat	UTM Zone	GMT/UTC Zone
French Frigate Shoals	-166.354917	-166.051027	23.884988	23.62388	3N	-10
Pearl & Hermes Atoll	-175.995512	-175.721074	27.965051	27.751793	1N	-10
Nihoa	-161.936415	-161.909151	23.072411	23.043949	4N	-10
St. Rogatien & Brooks Banks	-166.562	-167.554	24.703	23.883	3N	-10

3. Other permits (list and attach documentation of all other related Federal or State permits):

N/A.

3a. For each of the permits listed, identify any permit violations or any permit that was suspended, amended, modified or revoked for cause. Explain the circumstances surrounding the violation or permit suspension, amendment, modification or revocation.

There has been no violation or permit modification due to infractions.

4. Funding sources (Attach copies of your budget, specific to proposed activities under this permit and include funding sources. See instructions for more information):

The activity for which this permit is being requested is funded by the NOAA Coral Reef Conservation Program.

5. Time frame:
Activity start: April 29, 2008
Activity completion: May 28, 2008

Dates actively inside the Monument:
From: April 30, 2008
To: May 27, 2008

Describe any limiting factors in declaring specific dates of the proposed activity at the time of application:

CRED has utilized the best available information in planning the 2008 field season. However, it is always possible for last minute, unpredictable delays such as budget factors, unfavorable weather conditions, or necessary repairs to the NOAA Ship *Hi'ialakai*. As always, CRED will continue to be flexible and respond appropriately to accommodate any changes.

Personnel schedule in the Monument:

All personnel, as listed above, will participate in operations at both locations (FFS and P&H) within the Monument:

HI0804	
April 30th –May 1st	Transit within Monument to French Frigate Shoals.
May 1st- May 9th	Conduct benthic habitat mapping operations within French Frigate Shoals (FFS). If time permits, operations will also take place on the banks surrounding FFS (St. Rogatien and W. St. Rogatien) and areas in between.
May 9th- May 10th	Transit to Pearl & Hermes Atoll (P&H).
May 11th- May 23rd	Conduct benthic habitat mapping operations within P&H.
May 23rd- May 29th	Transit within Monument back to Honolulu; conduct deepwater surveys around St. Rogatien, Brooks Banks, and Nihoa Islands as time permits during transit.

6. Indicate (with attached documentation) what insurance policies, bonding coverage, and/or financial resources are in place to pay for or reimburse the Monument trustees for the necessary search and rescue, evacuation, and/or removal of any or all persons covered by the permit from the Monument:

These activities are being conducted by the U.S. Government, which is self-insuring.

7. Check the appropriate box to indicate how personnel will enter the Monument:

☒ Vessel
☐ Aircraft

Provide Vessel and Aircraft information:

The NOAA Ship *Hi'ialakai* will operate as a working platform for benthic habitat mapping operations deploying the *R/V Ahi* for daily operations during the dates mentioned above. The *Ahi* is equipped with a RESON 8101-ER multibeam echosounder and an Applanix POS/MV position and orientation system to perform mapping operations. It is an 8-m aluminum hulled boat with a diesel I/O that is powered by a 230 hp Volvo Penta KAD43 (PDF) with dual propeller inboard/outboard drive. The NOAA Ship *Hi'ialakai* will provide their 10-m Ambar jet boat if an additional vessel is needed to support operations. The 10-m Ambar is powered by a Yanmar 370 hp diesel jet inboard motor and has a 0.75 m draft.

***Please note that questions 8-13 are addressed under the NOAA Ship's permit.

8. The certifications/inspections (below) must be completed prior to departure for vessels (and associated tenders) entering the Monument. Fill in scheduled date (attach documentation):

☐ Rodent free, Date:
☐ Tender vessel, Date:
☐ Ballast water, Date:
☐ Gear/equipment, Date:
☐ Hull inspection, Date:

9. Vessel information (NOTE: if you are traveling aboard a National Oceanic and Atmospheric Administration vessel, skip this question):
Vessel name:
Vessel owner:
Captain's name:
IMO#:
Vessel ID#:
Flag:
Vessel type:
Call sign:
Embarkation port:
Last port vessel will have been at prior to this embarkation:
Length:
Gross tonnage:
Total ballast water capacity volume (m3):
Total number of ballast water tanks on ship:
Total fuel capacity:
Total number of fuel tanks on ship:
Marine Sanitation Device:
Type:

Explain in detail how you will comply with the regulations regarding discharge in the Monument. Describe in detail. If applicable, attach schematics of the vessel's discharge and treatment systems:

Other fuel/hazardous materials to be carried on board and amounts:

Provide proof of a National Oceanic and Atmospheric Administration (NOAA) Office of Law Enforcement-approved Vessel Monitoring System (VMS). Provide the name and

contact information of the contractor responsible for installing the VMS system. Also describe VMS unit name and type:

VMS Email:
Inmarsat ID#:

10. Tender information:

On what workboats (tenders) will personnel, gear and materials be transported within the Monument? List the number of tenders/skiffs aboard and specific types of motors:

Additional Information for Land Based Operations

11. Proposed movement of personnel, gear, materials, and, if applicable, samples:

12. Room and board requirements on island:

13. Work space needs:

DID YOU INCLUDE THESE?
☐ Map(s) or GPS point(s) of Project Location(s), if applicable
☐ Funding Proposal(s)
☐ Funding and Award Documentation, if already received
☐ Documentation of Insurance, if already received
☐ Documentation of Inspections
☐ Documentation of all required Federal and State Permits or applications for permits